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EXAMINER	
CHAN, ALEX H	

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2633	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/780,683	Applicant(s) SHARRATT ET AL.	
	Examiner Alex H Chan	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 February 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Reference number "650" of coupler described in various places of specification including second preliminary amendment to the specification is not found in the drawing corresponding to its figure. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: An optical interface for optical communication system including interconnected optical communication rings

2. The words "thereat (page 1, line 16)," "optimize," and "utilized" (e.g. page 20, line 30) might have been misspelled. Such misspellings are found in various places of specification. Correction is advised.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 22, 27-28, 31-34, 38, 40 and 42** are rejected under 35 U.S.C. 102(e) as being anticipated over U.S. Patent No. 6,590,681 B1 to Egnell et al (hereinafter Egnell).

Regarding claim 22, Egnell discloses an optical communication system (Fig. 1) comprising: first and second optical paths (7_{le} and 7_{lw} of Fig. 4) for guiding information-bearing optical radiation partitioned into wavebands (Col. 1, lines 14-22 and Col. 5, lines 15-16); interfacing means (Fig. 4) for selectively communicating (e.g. via add/drop nodes 1 of Fig. 4) radiation components corresponding to one or more of the wavebands from the first path to the second path (e.g. λ_{re1}, λ_{re2} communicates from 7_{le} to 7_{lw} via 37e, 43e and 35w of Fig. 5), the interfacing means comprising waveband selective diverting means (e.g. 31e of Fig. 4) and waveband selective coupling means (e.g. 23w or 17w of Fig. 4), the diverting means being included in the first path (e.g. 7_{le}) and operable to divert radiation components corresponding to one or more of the wavebands from the first path (e.g. by blocking one of opposite directions light of all wavelengths included in the wavelength bands from the first direction, Col. 12, lines 19-24) to provide diverted radiation, and the coupling means being operable to couple one or more radiation components (e.g. 23w couples wavebands from 35w with output from 31w) present in the diverted radiation to the second path (7_{lw} and 7_{rw} of Fig. 4); and the second path including waveband selective attenuating means (e.g. 31w of Fig. 4) for attenuating radiation of wavebands propagating along the second path (Col. 6, lines 30-32, lines 65-67 and Col. 7, 1-18), the coupling means being operable to add radiation originating from the first path to radiation output from the attenuating means (e.g. 23w adding signals λ_{re2} from 7_{le} to output of 3lw via 37e, 43e and 35w of Fig. 5), and the attenuating means being operable to attenuate radiation of

wavebands propagating along the second path (e.g. by attenuating λ_{termw1} or λ_{termw2} traveling along 7_{rw}) coincident in wavelength (i.e. having the same wavelengths) (Col. 10, lines 10-20) with radiation added by the coupling means.

Regarding claim 27, Egnell also discloses the waveband selective coupling means (e.g. 23w or 17w of Fig. 5) comprises waveband switching means (33e, 33w, 39e, or 39w of Fig. 4) for transferring information (e.g. via control unit 41 of Fig. 4) conveyed on a first set of the wavebands of the diverted radiation (e.g. via 31e to control unit 41) to a second set of the wavebands in the diverted radiation (Col. 9, lines 1-21) output to the second path.

Regarding claim 28, Egnell also discloses waveband switching means (33e, 33w, 39e, or 39w of Fig. 4) comprises waveband selecting means (e.g. 37e of Fig. 5) for isolating radiation of a selected waveband (e.g. isolating signal λ_{re2}) in the diverted radiation, detecting means for converting (e.g. via 11e of Fig. 5) the isolated radiation into a corresponding electrical signal (Col. 4, lines 44-48), and an optical radiation source (e.g. 13e of Fig. 5) modulatable by the signal (e.g. λ_{re2}) and operable to generate radiation bearing the signal (Col. 10, lines 21-26) and at a waveband mutually different to the selected waveband (Col. 5, lines 23-26), the generated radiation for output to the second path (e.g. via33e, 35w and 23w of Fig. 5).

Regarding claim 31, Egnell discloses the first and second paths (e.g. 7_{le} and 7_{lw} of Fig. 5) are operable to support bi-directional radiation propagation therealong (Col. 6, lines 57-60), and the interfacing means (e.g. Fig. 5) is operable to couple radiation of one or more of the wavebands (e.g. $\lambda_{re1},\lambda_{re2}\ldots\lambda_{ren}$) propagating in either direction along the first path to the second path for propagation in either direction therealong (e.g. signals on first path 7_{le} propagates from East to second path of West via 17e, 37e, 43e, 13e, 33e, 35w and 23w of Fig. 5).

Regarding claim 32, Egnell discloses the paths include one or more of linear paths (Fig. 6) and ring paths (Fig. 1).

Regarding claim 33, Egnell discloses at least one of the paths (e.g. 3l) is operable to support bi-directional radiation (e.g. via 5l and 5r of Fig. 5) propagation therealong, the at least one path including redirecting means for coupling (e.g.17e or 17w of Fig. 5) radiation of one or more wavebands from a first direction of radiation propagation (e.g. λ_{re2} traveling on 7_{le}) to a second direction of radiation propagation along the at least one path (e.g. λ_{re2} traveling to 7_{lw}), the second direction being mutually oppositely directed to the first direction (e.g. 7_{le} travels to east while 7_{lw} travels to west).

Regarding claims 34, 38, 40 and 42, the limitations introduced by claims 34, 38, 40 and 42 correspond to the limitations introduced by claims 22, 27, 28 and 31, respectively. The treatment of claims 22, 27, 28 and 31above reads on the corresponding limitations of claims 34, 38, 40 and 42.

5. **Claims 22, 26, 34 and 37-38** are rejected under 35 U.S.C. 102(e) as being anticipated over U.S. Patent No. 5,903,371 to Arecco et al (hereinafter Arecco).

Regarding claim 22, Arecco discloses an optical communication system (Fig. 1) comprising: first and second optical paths (8 and 9 of Fig. 1 or Fig. 2) for guiding information-bearing optical radiation partitioned into wavebands (Col. 1, lines 11-17); interfacing means for selectively communicating (Fig. 5) radiation components corresponding to one or more of the wavebands from the first path to the second path (Col. 2, lines 57-67 and Col., 3, lines 1-12), the interfacing means comprising waveband selective diverting means (e.g. optical coupler, 31 or coupler 30 of Fig. 5) and waveband selective coupling means (e.g. wavelength

selective coupler, 43-48 of Fig. 5), the diverting means being included in the first path (8 of Fig. 5) and operable to divert radiation components (e.g. signal at 8 of Fig. 5) corresponding to one or more of the wavebands from the first path (e.g. by separating telemetry signals with signals having wavelengths within the telecommunication bands, Col. 6, lines 15-27) to provide diverted radiation (e.g. to 31a or 31b or 32a or 32b of Fig. 5), and the coupling means being operable to couple one or more radiation components (e.g. coupling 28 and signals from 52 via 44 or coupling 56 and 30 of Fig. 5) present in the diverted radiation to the second path (e.g. diverted radiation 30 via signals from 9, 24, 26, 38, and 30 of Fig. 5) and the second path including waveband selective attenuating means (e.g. 49 or 42 (Col. 8, lines 66-67 & Col. 9, lines 1-2) or 45, 46, 47,48 (Col. 9, lines 38-54) of Fig. 5) for attenuating radiation of wavebands propagating along the second path, the coupling means (e.g. 46 of Fig. 5) being operable to add radiation originating from the first path (e.g. adding signals 54 via 23, 23', 53', 54' and 27') to radiation output from the attenuating means (e.g. to attenuated signals at 29 via 49 and 40 , resulting 27 of Fig. 5), and the attenuating means being operable to attenuate radiation of wavebands propagating along the second path (e.g. 49 attenuates optical signals from 9 via 24, 26, 36, 38 and 39) coincident in wavelength with radiation (e.g. via passing and reflecting corresponding wavelength, Fig. 3 and Col. 9, lines 17-37) added by the coupling means.

Regarding claim 26, Arecco discloses the diverting means, the attenuating means and the coupling means operate on the information-bearing radiation in the optical domain to couple at least a part of the radiation from the first path to the second path without needing to convert any part of the radiation into a corresponding electrical signal and back to corresponding optical radiation (Col. 1, lines 11-21).

Regarding claim 27, Arecco discloses the waveband selective coupling means (e.g. 45 of Fig. 5) comprises waveband switching means for transferring information (e.g. 37 of Fig. 5) conveyed on a first set of the wavebands of the diverted radiation to a second set of the wavebands in the diverted radiation output to the second path (Col. 3, lines 33-36).

Regarding claims 34 and 37-38, the limitations introduced by claims 34 and 37-38 correspond to the limitations introduced by claims 22 and 26-27, respectively. The treatment of claims 22 and 26-27 above reads on the corresponding limitations of claims 34 and 37-38.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 23-25 and 35-36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Egnell in view of U.S. Patent No. 6,519,060 B1 to Liu.

Regarding claim 23, Egnell discloses a waveband selective filtering means (e.g. 3le or 37e or 37w of Fig. 5) for separating (e.g. separating light signal including at least all wavelengths, Col. 7, lines 59-60) at least part of the information-bearing radiation (e.g. by blocking λ_{termw1}, $\lambda_{termw2...}$ via 3le) propagating along the first path into spatially separated rays (e.g. into wavelength of channels) each ray corresponding to radiation of an associated waveband (Col. 8, lines 56-67 and Col. 9, line 1). He also discloses an attenuating means (e.g. 31e or 31w of Fig. 5) associated with each ray for selectively directing (e.g. by passing only wavelengths which are not included in the set of wavelength λ_{termw1}, λ_{termw2} of channels) radiation

corresponding to the waveband of the ray (Col. 6, lines 30-32, lines 65-67 and Col. 7, 1-18), the directed radiation contributing to the diverted radiation provided to the coupling means (e.g. 23w of Fig. 5). Though he discloses an attenuating means, he fails to disclose a liquid crystal attenuating means. Liu discloses a liquid crystal rotator (Col. 9, lines 24-31) allowing regulation and attenuation (liquid attenuating means) (Col. 9, lines 32-51) for selectively directing radiation corresponding to the waveband of the ray (e.g. if rotator changes both branches of the input signal, then half of input signal get routed to output port and other half into drop port, Col. 9, line 41-46). Accordingly, one of the ordinary skill in the art would have been motivated to incorporate a liquid crystal rotator as an attenuating means since it is preferred commercially using liquid crystal based technology (Col. 9, lines 30-31, Liu), and therefore, it would have been obvious to one of artisan at the time the invention was made to have modified the optical WDM network of Egnell by substituting a liquid crystal attenuating means as taught by Liu.

Regarding claim 24, Egnell in view of Liu discloses all limitations as recited in rejecting claim 23, further discloses coupling means (e.g. 17w or 17e of Fig. 5, Egnell) comprises waveband selective filtering (e.g. 37w or 37e of Fig. 5, Egnell) and liquid crystal attenuating means (e.g. liquid crystal rotator, 515 of Fig. 5, Liu) associated with each ray for selectively transmitting or diverting radiation corresponding to the waveband of the ray (Col. 6, lines 30-32, lines 65-67 and Col. 7, 1-18, Egnell), thereby selectively providing radiation for output to the second path (e.g. from 1st path to 2nd path via 17e, 37e, 43e, 35w and 23w or via 17w, 37w, 43e, 35w and 23w, Egnell).

Regarding claim 25, Egnell in view of Liu discloses all limitations as discussed above, further discloses the attenuating means (e.g. 31e or 31w of Fig. 5, Egnell) comprises waveband

selective filtering (e.g. 31e or 31w or 37e or 37w of Fig. 5 & Col. 6, lines 30-32, lines 65-67 and Col. 7, 1-18, Egnell).

Regarding claims 35-36, the limitations introduced by claims 35-36 correspond to the limitations introduced by claims 23-24, respectively. The treatment of claims 23-24 above reads on the corresponding limitations of claims 35-36.

8. **Claims 29-30, 39 and 41** are rejected under 35 U.S.C. 103(a) as being unpatentable over Egnell in view of U.S. Patent No. 5,353,146 to Webb.

Regarding claim 30, Egnell fails to disclose that the coupling means incorporates regenerating means for regenerating the diverted radiation propagation therethrough. Webb discloses an optical coupler (coupling means) incorporating an optical regenerator (regenerating means) (Fig. 5) for generating information signals (diverted radiation). Accordingly, one of ordinary would have been motivated to incorporate coupling means having regenerating means in order to reduce the control requirement on the wavelength of the information signal (Col. 2, lines 60-68 & Col. 3, lines 1-2), and therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the optical WDM network of Egnell to replace the coupling means with coupling means having regenerating means as taught by Webb.

Regarding claim 29, Egnell in view of Webb discloses the waveband switching means (33e, 33w, 39e, or 39w of Fig. 4, Egnell) comprises waveband selecting means (e.g. 37e or 37w of Fig. 4, Egnell) for isolating radiation of a selected waveband (e.g. isolating signal λ_{re2} or λ_{rw2}, Egnell) in the diverted radiation, and an optical radiation source (e.g. 13e or 13w of Fig. 4, Egnell). Although he does not explicitly disclose that the optical radiation source is biased substantially at its lasing threshold, however, the examiner takes Official Notice that it is

extremely well known in the electrical art the optical source must be biased to establish a reference level to operate and control the device at a predetermined lasing threshold (e.g. Webb also provides teachings of lasing threshold, Col. 1, lines 35-65, Webb) since the lasing threshold is the lowest excitation level at which laser or optical output is dominated by stimulated emission rather than by spontaneous mission and thereby allowing the source being operable to be stimulated by the isolated radiation such that stimulated radiation generated by the source (e.g. output signal of 13e of Fig. 5, Egnell) is modulated by information carried (e.g. λ_{re2} and Col. 1, lines 14-24, Egnell) by the isolated radiation, the stimulated radiation being at a waveband mutually different to the selected waveband (Col. 5, lines 23-26, Egnell), the stimulated radiation for output to the second path (e.g. via33e, 35w and 23w of Fig. 5, Egnell).

Regarding claims 39 and 41, the limitations introduced by claims 39 and 41 correspond to the limitations introduced by claims 29 and 30, respectively. The treatment of claims 29 and 30 above reads on the corresponding limitations of claims 39 and 41.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Beine et al is cited to show an optical network in an east-west routing system and its components. Isgiwatari is cited to show another east-west system having add-drop ports in a ring network. Maxham is cited to demonstrate another east-west or bi-directional optical supervisory channel for directing optical signals. Mukojima is cited to show signal level control via components such as attenuators, amplifiers, splitters and multiplexers. Graves is cited to show an optical network for routing IP packets. Takai et al is cited to show bi-directional routing of signals, its components and wavelength conversion. Al-Salameh is cited to illustrate an IP router

and its methods for restoring packets in an optical ring. Fee is cited to demonstrate optical regenerator in a bi-directional loop or ring. Yasui is cited to show a wavelength controller for selecting unused optical wavelengths in a wavelength multiplex network and outputs control wavelength. Al Salameh et al is cited to show a bi-directional optical WDM network for transmitting and routing different wavelengths and channels. Sugaya is cited to show components of a multi-wavelength light transmission system. Yamane is cited to show a switching system in a bi-directional network. Onoda et al is cited to show optical amplifiers in a bi-directional network having a controller for detecting optical signal power. Terahara is cited to show another bi-directional network for transmitting different wavelengths and its add/drop methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Alex Chan
Patent Examiner
October 9th, 2003

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